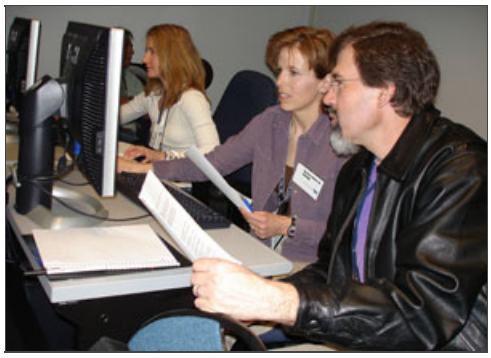
Joni Barnes of INL, far left, Debby Bruhn, center and Wenxian Zhu of ISU, right, attended a two-day genome biology workshop at INL on Apr. 2 and 3. Each day included a lecture, followed by a three-hour, hands-on lab session in an INL high performance computing laboratory emphasizing computational methods.

INL, CAES, and ISU host genome workshop

By Keith Arterburn

More than 27 researchers attended a two-day workshop on genome biology topics held at the Idaho National Laboratory's Engineering Research Office Building

The workshop was sponsored by the Bioinformatics Group of the INL's Biological Systems Department, the Microbial Metabolic Systems Distinctive Scientific Signature and the Center for Advanced Energy Studies (CAES). Attendees included INL and North Wind, Inc. employees, as well as students and researchers from Idaho universities, including Idaho State University Boise State University and The College of Idaho.



On Apr.3, Heather Silverman of INL, left, Michelle Walton of INL, center, and Scott Truska of The College of Idaho attended a lecture focused on protein pathways and neural networks, which was followed by computer-based exercises using graphical software packages to visualize protein folding and protein-protein interactions.

Genomic biological researchers investigate chemical and cellular functions to leverage new information for development of improved environmental and industrial processes. For example, researching new bioenergy production methods helps make efficient use of agricultural wastes to generate biofuels.

The workshop covered computational bioinformatics tools related to microbial genomics and proteome analysis. Michael Thomas, assistant professor of the Evolutionary Genomics Group, and Mitch Day, postdoctoral associate - both from Idaho State University's Biological Sciences department - presented materials for the workshop.

Cody Permann of INL's Center for Advanced Modeling, left, Gong Xin Yu of Boise State University, second from left, David Reed of INL, and Jeff Lacey of INL participate in a three-hour, hands-on laboratory in an INL high performance computing laboratory, which exercised computational methods.

The format was a classroom lecture followed by a three-hour, hands-on lab session in an INL high performance computing laboratory emphasizing computational methods. The first lecture emphasized finding and assigning functions to genes. Then, a computer laboratory session was held that introduced students to a variety of software programs and sophisticated mathematical methods to aid in identifying potential genes in unknown DNA sequences. The second day focused on protein pathways and neural networks. It was supplemented by computer-based exercises using graphical software packages to visualize protein folding and protein-protein interactions

Scientific Signature lead Melinda Hamilton said, "These kinds of workshops offer important biological computational skill development for students and researchers and serve as a catalyst for pursuing microbial and protein research. In addition, it gives us opportunities for collaboration with our regional business and university partners."

Cody Permann, high performance computing specialist in the Center for Advanced Modeling and Simulation (CAMS), presented the following insight into the relationship between computer modeling and biological research. "Our ability to host the Genome Workshop is key to developing partnerships between the INL, CAES and regional universities. These forums offer opportunities for enhancing the skills of researchers in biological systems as well as utilizing our advanced computing capabilities at the INL."

Emphasizing the need for skill-building workshops, Thomas said, "Biological investigations rely increasingly upon advanced computational skills. Without these skills, researchers in the future will be very limited on what they can accomplish."

Two researchers who initiated the Bioinformatics Group at INL, Amber Miller and Heather Silverman, recruited the speakers and promoted the

workshop to students and researchers.

"This workshop is one of a series of forums planned by the Bioinformatics Group to improve opportunities for INL researchers," said Miller. Silverman added, " We need to improve our bioinformatics computational skills and establish collaborations with research partners in the region."

Feature Archive

Joni Barnes of INL, left, and Angela Stormberg, right, team together in a computational methods exercise that followed a lecture on protein pathways and neural networks on Apr. 3 at INL.